ELSEVIER

Nuclear Instruments and Methods in Physics Research B 98 (1995) ix–xvi

NIM B
Beam Interactions with Materials & Atoms

Contents

Foreword vii
Committees viii

Section 1. Highly charged ions: fundamental aspects, structure and spectroscopy

Relativistic and QED effects in highly charged ions
E. Lindroth 1
Spectroscopy on highly charged ions – recent advances using tokamaks, laser-produced plasmas and straight ion beams
E. Träbert 10
Auger transitions involving Rydberg states in multiply excited atoms
J.P. Desclaux 18
Ion charge-state production and photoionization near the K-edge in argon and potassium
H.G. Berry, Y. Azuma, P.L. Cowan, D.S. Gemmell, T. LeBrun and M.Ya. Amusia 25
Fine structure energies for the $1s2s\,^3S–1s2p\,^3P$ transition in helium-like ions
A.E. Livingston, K.W. Kukla, C.M. Vogel Vogt, H.G. Berry, R.W. Dunford, D.S. Gemmell, E.P. Kanter, J. Suleiman, R. Ali, S. Cheng and L.J. Curtis 28
Spectra simulations of Be-like $1s2\,x2\,ynz–1s^2\,2\,xnz$ satellite transitions of highly ionized ions
F.B. Rosmej 33
The diagnostic ratio of the intercombination and resonance lines of He-like ions: influence of energetic electrons and non-stationarity
O.N. Rosmej and F.B. Rosmej. 37
Measurement of the $2s^2S_{1/2}–2p^2P_{3/2}$ wavelength in Li-like nickel
R. Büttner, U. Staude, M. Nicolai, J. Braukhoff, K.-H. Schartner, F. Folkmann and P.H. Mokler 41
Wavelength measurements of the He-like krypton K-shell spectrum
K. Widmann, P. Beiersdorfer and V. Decaux 45
Beam-foil studies of highly ionized Nb
R. Hutton, S. Huldt, B. Nyström, I. Martinson, K. Ando, T. Kambara, Y. Kanai, Y. Nakai and Y. Awaya 48
Experimental determination of long atomic lifetimes of ions in a storage ring
J. Doerfert, E. Träbert, J. Granzow, A. Wolf, J. Kenntner, D. Habs, M. Grieser, T. Schüßler, U. Schramm and P. Forck 53
Beam-foil lifetime measurements in Cu-like Nb XIII and Zn-like Nb XII
J.A. Kernahan, E.H. Pinnington and E. Träbert 57
Photon spectroscopy of slow He^{q+} + He (q = 1,2) collisions
B. Nyström, R. Hutton, S. Huldt, F. Heijkenskjöld, A. Langereis, M.O. Larsson, M. Wang and A. Wännström 62
Selective beam-gas spectroscopy of the quartet system of NV
A. Denis, J. Désesquelles, S. Martin, J. Bernard, L. Chen and Y. Ouerdane 65
Spectral distribution of the two-photon decay of He-like krypton
R. Ali, I. Ahmad, H.G. Berry, R.W. Dunford, D.S. Gemmell, E.P. Kanter, P.H. Mokler, A.E. Livingston, S. Cheng and L.J. Curtis 69
Cascading de-excitation in multiply ionized atoms
C. Günther and E. Hartmann 74

0168-583X/95/$09.50 © 1995 Elsevier Science B.V. All rights reserved

Properties of high-lying doubly excited states of Ne^{8+} populated during Ne^{10+} + He collisions
H. Bachau and I. Sánchez 78

Ejected electron spectra from triplet states of doubly-excited O^{4+} and Ne^{6+}
Y. Kanai, T. Kambara, Y. Awaya, H. Ida, Y. Matsui, T. Takayanagi, K. Wakiya, N. Nakamura, M. Koide, S.-i. Kitazawa and S. Ohtani 81

The screening and relativistic effects on the energies of Coster–Kronig electrons produced during the autoionizing decay of $1s^2 2p9l$ Rydberg states of S^{12+} ions
I.Y. Tolstikhina and H. Tawara 85

Dielectronic satellite spectra of the $1s^2$–1s3p lines for highly-charged ions with $Z = 6$–54: $1s^2 2l''$–$1s2l'3l$ transitions
U.I. Safronova, M.S. Safronova, R. Bruch and L.A. Vainshtein 88

Section 2. Highly charged ion related processes in plasmas and strong fields

Review of X-ray lasers
D.L. Matthews 91

Neutral density measurements at the plasma edge of the Tore Supra tokamak with carbon charge exchange lines
W.R. Hess, C. De Michelis, M. Mattioli, R. Guirlet and M. Druetta 95

Calculation of spectator satellite lines of nickel-like gold ions in high density thermonuclear plasma
F. Koike 98

Influence of atomic properties of load ions on pinched plasma parameters in annular *Z*-pinches
J. Rauš and V. Babický 100

Section 3. Collisions of highly charged ions with photons, electrons, atoms, molecules and ions

Overview of the theory of highly charged ions
J.H. McGuire and J. Wang 104

3.1. Collisions with electrons

Collisions of electrons with highly-charged ions
G.H. Dunn, N. Djurić, Y.-S. Chung, M. Bannister and A.C.H. Smith 107

Studies of highly charged ions with EBIT and super-EBIT
S.R. Elliott 114

Electron collisions with very highly charged ions – Relativistic calculations
D.L. Moores and K.J. Reed 122

Elastic scattering of electrons from ions
J.B. Greenwood, I.D. Williams, B. Srigengan, W.R. Newell, J. Geddes and R.W. O'Neill 125

Excitation mechanisms of $2s_{1/2}$–$2p_{3/2}$ and $2p_{1/2}$–$2p_{3/2}$ transitions in U^{82+} through U^{89+}
V. Decaux, P. Beiersdorfer and A. Osterheld 129

Electron impact excitation of Ar^{6+} ($3s^2\,{}^1S \rightarrow 3s3p\,{}^1P$)
D. Jalabert, C. Ristori, M. Maurel, J.C. Rocco and B.A. Huber 132

Absolute electron impact ionization cross sections for highly charged ions: Scaling law for hydrogen-like ions
H. Deutsch and T.D. Märk 135

Single and multiple ionization of Ni^{q+} ions by electron impact
M. Stenke, D. Hathiramani, G. Hofmann, V.P. Shevelko, M. Steidl, R. Völpel and E. Salzborn 138

Resonant electron impact ionization and recombination of Li-like Cl^{14+} and Si^{11+} at the Heidelberg Test Storage Ring
J. Kenntner, J. Linkemann, N.R. Badnell, C. Broude, D. Habs, G. Hofmann, A. Müller, M.S. Pindzola, E. Salzborn, D. Schwalm and A. Wolf 142

Laser induced two-step recombination for the study of Rydberg states in highly charged ions
T. Schüßler, U. Schramm, M. Grieser, D. Habs, T. Rüter, D. Schwalm and A. Wolf 146
Electron impact ionization of krypton ions ($q = 8$–13)
E.M. Oualim, M. Duponchelle and P. Defrance 150
Electron impact ionization and dielectronic recombination of sodium-like iron ions
J. Linkemann, J. Kenntner, A. Müller, A. Wolf, D. Habs, D. Schwalm, W. Spies, O. Uwira, A. Frank, A. Liedtke, G. Hofmann, E. Salzborn, N.R. Badnell and M.S. Pindzola 154
Towards a precision spectroscopy of very highly charged ions by employing dielectronic recombination
W. Spies, O. Uwira, A. Müller, J. Linkemann, L. Empacher, A. Frank, C. Kozhuharov, P.H. Mokler, F. Bosch, O. Klepper, B. Franzke and M. Steck 158
Recombination of U^{28+} ions in a dense, cold electron target
O. Uwira, A. Müller, W. Spies, A. Frank, J. Linkemann, L. Empacher, P.H. Mokler, R. Becker, M. Kleinod and S. Ricz 162
X-rays from recombination of bare ions with electrons in an electron cooler
M. Pajek and R. Schuch 165

3.2. Collisions of highly charged ions with heavy particles

3.2.1. Collisions with heavy particles: single electron capture

Electron capture by slow multiply charged ions from H(1s)
R.W. McCullough 170
Anisotropy effects in single electron transfer between laser excited atoms and highly charged ions
S. Schippers. 177
Interaction of slow highly charged ions with atoms, clusters and solids: a unified classical barrier approach
A. Bárány and C.J. Setterlind 184
On the application of probability absorbers and doorway states in atomic collisions
L.F. Errea, A. Riera and P. Sánchez 187
Compilation and analytic fitting of state-selective electron capture cross sections in collisions of Be^{q+}, B^{q+}, Al^{q+} Si^{q+}, Ti^{q+}, V^{q+}, Ni^{q+}, Kr^{q+}, and Mo^{q+} ions with H, H_2 and He
C. Cisneros, I. Alvarez and J. de Urquijo 190
Cross sections for HeII($n = 4 \rightarrow n = 3$) and CVI($n = 7 \rightarrow n = 6$) emission for charge exchange diagnostics at tokamaks
F.W. Bliek, H.O. Folkerts, R. Morgenstern, R. Hoekstra, L. Meng, R.E. Olson, W. Fritsch, M. von Hellermann and H.P. Summers 195
First measurements of state-selective one-electron capture by 4–24 keV N^{4+} ions in H and H_2
R.W. McCullough, T.K. McLaughlin, J.M. Hodgkinson and H.B. Gilbody 199
Differential cross sections for single-electron capture processes by low-energy multiply charged ions
K. Akgüngör, E.Y. Kamber, J. Edens, S.M. Ferguson and R. Said 204
Charge transfer processes in SiH^{2+}
G. Chambaud, S. Bliman, P. Rosmus, J. Senekowitsch and S. ONeil 208
Charge exchange spectroscopy of Xe^{q+} ($q = 7$–8) + He collisions
M. Druetta and D. Hitz 211
Line emission and anisotropy effects in C^{6+} electron capture from Li(2s), $Li^*(2p)$ and $H^*(n = 2)$
R.E. Olson and R. Hoekstra 214
Velocity effect in the l-distribution of the electron capture in collisions of highly charged Ar^{8+} ions with a Li(2s) target
E. Jacquet, J. Pascale, P. Boduch, M. Chantepie and D. Lecler 218
Dipole moments and anisotropies for electron capture collisions between H^+, He^{+2} and Na(3s,3p)
C.J. Lundy and R.E. Olson 223

Influence of the molecular alignment on electron capture from H_2 by O^{8+} projectiles
H.F. Busnengo, S.E. Corchs, R.D. Rivarola and J.H. McGuire 227
Relativistic highly charged ion collisions
G.R. Deco, O.A. Fojón and R.D. Rivarola. 231
Radiative electron capture in relativistic heavy-ion atom collisions
Th. Stöhlker, F. Bosch, H. Geissel, T. Kandler, C. Kozhuharov, P.H. Mokler, R. Moshammer, P. Rymuza, C. Scheidenberger, Z. Stachura, A. Warczak, J. Eichler, A. Ichihara and T. Shirai 235
Angular differential cross section measurements in light ion–ion collision systems
A. Pfeiffer, S. Krüdener, F. Melchert, L.P. Presnyakov, R. Schulze, S. Meuser, T. Bartsch, C. Brandau, K. v. Diemar, K. Huber and E. Salzborn. 240
Quasi-resonant charge exchange in $C^{2+} + B^{+}$ collisions
C. Brandau, S. Krüdener, F. Melchert, L.P. Presnyakov, R. Schulze, S. Meuser, T. Bartsch, K. v. Diemar, A. Pfeiffer, K. Huber and E. Salzborn 243

3.2.2. Collisions with heavy particles: double electron capture

Electron transfer and excitation in slow collisions of bare He, Be, and C ions with atomic helium
W. Fritsch. 246
Charge transfer in C^{2+} + He collisions at low impact energies
J.F. Castillo, I.L. Cooper, L.F. Errea, L. Méndez and A. Riera 250
Core-electron effect in state-selective electron capture collisions of highly charged ions with alkali-metal atom targets
E. Jacquet and J. Pascale 253
Dissociative electron capture in Ar^{8+}/N_2 collisions
A. Remscheid, B.A. Huber and K. Wiesemann. 257
Two-center electron–electron interactions in collisions of fast Ne^{7+} and Ne^{6+} ions with gas atoms
B. Sulik, S. Ricz, I. Kádár, G. Xiao, G. Schiwietz, K. Sommer, R. Köhrbrück, M. Grether and N. Stolterfoht. 262
Target and ion charge dependences of double capture processes in A^{q+} $(1s^2)$ + He, H_2 ($q = 4$ to 8) collisions, at $V_{coll} \simeq 0.4$ a.u.
M. Benhenni, P. Moretto-Capelle, A. Bordenave-Montesquieu and M. Boudjema 266
Velocity dependence of stabilized double electron capture in N^{7+}–Ar collisions
S. Martin, J. Bernard, A. Denis, J. Désesquelles, L. Chen and Y. Ouerdane. 270
Direct and indirect stabilisation mechanisms in multiple electron capture
P. Roncin, M. Barat, M.N. Gaboriaud, Z.S. Szilagyi and A.K. Kazansky 275
Charge state distributions in iron following electron capture by H^{+} and He^{2+} ions
M.B. Shah, C.J. Patton, J. Geddes and H.B. Gilbody 280
Absolute cross sections for the multielectron processes in 15 keV I^{10+} + rare gas collisions
N. Nakamura, F.J. Currell, A. Danjo, M. Kimura, A. Matsumoto, S. Ohtani, H.A. Sakaue, M. Sakurai, H. Tawara, H. Watanabe, I. Yamada and M. Yoshino 284
Study of multiple capture processes by recoil ion momentum spectroscopy for 150 keV Ne^{10+}–Ar collisions
S. Duponchel, D. Hennecart, A. Cassimi, D. Lecler, X. Husson, P. Jardin, H. Rothard, F. Fremont and J.P. Lemoigne 288
Transfer excitation in the molecular regime
M.N. Gaboriaud, M. Barat, P. Roncin and V. Sidis 292
Capture, excitation and ionization in H^{+} + $He^{+}(1s)$ collisions
C. Harel, H. Jouin, B. Pons, L.F. Errea, L. Mendez and A. Riera 297
Search for resonant electron-transfer-double excitation in $Kr^{34+} + H_2$ collisions
K.E. Zaharakis, R.R. Haar, O. Woitke, M. Zhu, J.A. Tanis and N.R. Badnell. 300
Radiative double electron capture in heavy-ion atom collisions
A. Warczak, M. Kucharski, Z. Stachura, H. Geissel, H. Irnich, T. Kandler, C. Kozhuharov, P.H. Mokler, G. Münzenberg, F. Nickel, C. Scheidenberger, T. Stöhlker, T. Suzuki and P. Rymuza 303

3.2.3. Collisions with heavy particles: excitation

Target excitation in bare ion Xe/Ar collisions studied by electron target ion coincidences
G. de Nijs, R. Hoekstra and R. Morgenstern 307
Excitation of Ar^{16+} projectiles in intermediate velocity collisions with neutrals
L. Adoui, D. Vernhet, K. Wohrer, J. Plante, A. Chetioui, J.P. Rozet, I. Despiney, C. Stephan, A. Touati, J.M. Ramillon, A. Cassimi, J.P. Grandin and M. Cornille 312
Excitation in Kr^{34+} + C, Si, Ar, Cu and Zr at intermediate velocities
A. Macías, F. Martín, A. Riera and J.L. Sanz 316

3.2.4. Collisions with heavy particles: ionization

Resonant transfer and excitation investigated via X-ray emission in $U^{90+} \rightarrow C$ collisions
T. Kandler, P.H. Mokler, H. Geissel, H. Irnich, Ch. Kozhuharov, A. Kriessbach, M. Kucharski, G. Münzenberg, F. Nickel, P. Rymuza, C. Scheidenberger, Z. Stachura, Th. Stöhlker, T. Suzuki, A. Warczak, D. Dauvergne and R. Dunford 320
Two-electron excitation to Rydberg levels in fast I^{6+} on hydrogen collisions
C. Liao, S. Hagmann, T.J.M. Zouros, E.C. Montenegro, G. Toth, P. Richard, S. Grabbe and C.P. Bhalla 324
Double-electron excitations in helium induced by fast multicharged ions
V.A. Sidorovich 328
Double-electron removal from H^- in collisions with highly charged ions
L.P. Presnyakov, H. Tawara and D.B. Uskov 332
Molecular treatment of $H^+ + H^-$ collisions at intermediate energies
L.F. Errea, C. Harel, P. Jimeno, H. Jouin, L. Méndez and A. Riera 335
Quantitative two-center effects in single ionization
L. Gulyás, P.D. Fainstein and A. Salin 338
Effects of electron–electron interaction in ionization by structured particle impact
K. Tökési, J. Wang and R.E. Olson 343
Diffraction structures in binary encounter electron spectra: a dominant feature for projectiles above Cl and a tool to study the ionization mechanism
C. Liao, S. Hagmann, C.P. Bhalla, S. Grabbe, P. Richard and H. Schmidt-Böcking 347
Cusp-electron production in intermediate-energy O^{7+} + Ar collisions
M. Zhu, R.R. Haar, S.M. Ferguson, O. Woitke, J.A. Tanis, L. Sarkadi, J. Pálinkás, P.A. Závodszky and D. Berényi 351
Charge dependence of differential and total electron emission yield at ionization of helium by fast ions
A.L. Godunov and V.A. Schipakov 354
Binary encounter electron emission in collisions of highly charged ions with helium gas targets
U. Ramm, U. Bechthold, O. Jagutzki, S. Hagmann, G. Kraft and H. Schmidt-Böcking 359
Single and double ionisation of He by HCI – a recoil ion momentum study
P. Jardin, A. Cassimi, J.P. Grandin, H. Rothard, J.P. Lemoigne, D. Hennecart, X. Husson and A. Lepoutre 363
Electron–electron interaction in projectile ionization
R. Dörner, V. Mergel, R. Ali, U. Buck, C.L. Cocke, K. Froschauer, O. Jagutzki, S. Lencinas, W.E. Meyerhof, S. Nüttgens, R.E. Olson, H. Schmidt-Böcking, L. Spielberger, K. Tökesi, J. Ullrich, M. Unverzagt and W. Wu 367
Search for inelastic electrons scattered off ions in energetic ion–atom collisions
T.J.M. Zouros, C. Liao, S. Hagmann, G. Toth, E.C. Montenegro, P. Richard and E.P. Benis 371
Ionization collision dynamics in 3.6 MeV/u Ni^{24+} on He encounters
J. Ullrich, R. Moshammer, M. Unverzagt, W. Schmidt, P. Jardin, R.E. Olson, R. Dörner, V. Mergel and H. Schmidt-Böcking 375

3.2.5. Collisions with heavy particles: miscellaneous

Elastic energy losses of ions and atoms in atomic collisions
I.S. Tilinin 380
Ion-impact-induced fragmentation of water molecules
U. Werner, K. Beckord, J. Becker, H.O. Folkerts and H.O. Lutz 385
Dissociation of H_2 and CO by slow multiply charged ions
H.O. Folkerts, F.W. Bliek, M.C. de Jong, R. Hoekstra and R. Morgenstern 389

Section 4. Interaction of highly charged ions with surfaces, clusters and solids

Probing surfaces with low-energy ions
E. Taglauer 392
Simulation of low-energy HCI–solid interaction
Y. Yamamura, S.T. Nakagawa and H. Tawara 400
Theoretical study of image charge acceleration of highly charged ions in front of a metal surface
C.J. Setterlind and A. Bárány 407
Theory of Auger neutralization of highly charged ions at a metal surface
U. Wille 410
Fast neutralization of highly charged ions in grazing incidence collisions with surfaces
J. Burgdörfer, C. Reinhold and F. Meyer 415
Auger capture and transition rates for highly charged ions in an electron gas
R. Díez Muiño, A. Arnau and P.M. Echenique 420
Auger deexcitation rates in grazing atom–surface collisions
M. Alducin and J.I. Juaristi 424
Auger and X-ray spectra formed at highly charged ion neutralization near the metal surface
M.N. Mirakhmedov 429
Probing hollow atom states formed during impact of highly charged ions on surfaces: $N^{6,7+}$ and O^{7+} on Al(110) and Si(100)
J. Limburg, S. Schippers, I. Hughes, R. Hoekstra, R. Morgenstern, S. Hustedt, N. Hatke and W. Heiland 436
Projectile image acceleration, neutralization and electron emission during grazing interactions of multicharged ions with Au(110)
F.W. Meyer, L. Folkerts, H.O. Folkerts and S. Schippers 441
The role of surface plasmons in ion-induced kinetic electron emission
F.J. García de Abajo 445
Contribution of kinetic emission to multicharged ion-induced electron emission from a metal surface
J. Kawata and K. Ohya 450
Scattering potential investigation in highly charged ion–surface interactions
S. Hustedt, N. Hatke, W. Heiland, J. Limburg, I.G. Hughes, R. Hoekstra and R. Morgenstern 454
Negative ion production in multicharged ion–surface interactions
I.G. Hughes, J. Limburg, R. Hoekstra, R. Morgenstern, S. Hustedt, N. Hatke and W. Heiland 458
The emission of atomic and molecular ions under single and multiple-charged rare gas ion bombardment of LiF, KCl, SiC
B.G. Atabaev, S.S. Radjabov and M.K. Akhmadzhanova 462
Secondary ion emission from lithium fluoride under impact of slow multicharged ions
T. Neidhart, F. Pichler, F. Aumayr, HP. Winter, M. Schmid and P. Varga 465
Stability of multiply-charged cluster and fullerene ions
T.D. Märk and P. Scheier 469
The interactions of high-energy, highly charged Xe ions with fullerenes
T. LeBrun, H.G. Berry, S. Cheng, R.W. Dunford, H. Esbensen, D.S. Gemmell, E.P. Kanter and W. Bauer 479

Ionization and fragmentation of metallic clusters (Na_n) induced by ion impact
F. Chandezon, C. Guet, B.A. Huber, D. Jalabert, M. Maurel, E. Monnand, C. Ristori and J.C. Rocco . 482

Impact-parameter dependent L–K vacancy-transfer in collisions of Ni^{23+} with Ge solid targets
M. Jäger, M. Schulz, T. Kandler, A. Warczak, H. Bräuning, A. Demian, M. Damrau, A. El-Sadek, K. Freitag, J. Ullrich and H. Schmidt-Böcking 488

Carbon foil thickness dependent electron yields induced by swift highly charged ions
A. Billebaud, C. Caraby, A. Cassimi, M. Chevallier, B. Gervais, J.-P. Grandin, K.-O. Groeneveld, P. Jardin, M. Jung, R. Maier and H. Rothard 492

Radiative electron capture by fully stripped channeled light ions as a probe to investigate the "ion–solid-state" effect
L.C. Tribedi, V. Nanal, M.B. Kurup, K.G. Prasad and P.N. Tandon 497

Section 5. Highly charged ions: production, experimental methods and applications

Highly-charged ions in storage rings and ion traps
H.-J. Kluge 500

Recent progress in making highly charged ion beams
P. Sortais 508

The new 14.5 GHz Caprice ECR ion source: gaseous and metallic ion production
D. Hitz, P. Ludwig, G. Melin and M. Pontonnier 517

A 14 GHz electron-cyclotron-resonance (ECR) ion source for ion–electron collision studies
M. Schlapp, R. Trassl, A. Heyer and E. Salzborn 521

An ultra compact 10 GHz electron-cyclotron-resonance ion source (ECRIS) for multiply charged ions production
M. Schlapp, R. Trassl, E. Salzborn, R.W. McCullough, T.K. McLaughlin and H.B. Gilbody 525

Slow, highly charged ions from a 7.25 GHz ECR ion source
D. Henke, H. Tyrroff, R. Grötzschel and H. Wirth 528

Highly charged metal ion beams produced from organometallic compounds
H. Waldmann and B. Martin 532

Improvement of highly charged ion output from an ECR source
G.D. Shirkov 536

A high density pulsed ion trap
M. Ganciu, I.I. Popescu, V. Zoran and A.M. Pointu 541

Numerical study on the gas mixing effect in ECR ion sources
H.W. Zhao, A.A. Efremov and V.B. Kutner 545

Non-stationary plasma ionisation kinetics in ECR ion sources
M. Cavenago 549

Simulation of HCI movement in magnetic traps of ECR ion sources
S. Biri, J. Vámosi, K.E. Stiebing and H. Schmidt-Böcking 553

Fourier transform–ion cyclotron resonance mass spectrometry – A new tool for measuring highly charged ions in an electron beam ion trap
P. Beiersdorfer, S. Becker, B. Beck, S. Elliott, K. Widmann and L. Schweikhard 558

Determination of the number of ions in the Oxford electron beam ion trap
H.S. Margolis, A.J. Varney, R.A. Jarjis and J.D. Silver 562

Measurement of the temperature of cold highly charged ions produced in an electron beam ion trap
P. Beiersdorfer, V. Decaux and K. Widmann 566

Charge exchange between Xe^{44+} and H_2 in an ion trap
J. Steiger, G. Weinberg, B. Beck, D.A. Church, J. McDonald and D. Schneider 569

A high-current electron gun for crossed-beams electron–ion collision studies at keV energies
M. Stenke, K. Aichele, D. Hathiramani, G. Hofmann, M. Steidl, R. Völpel and E. Salzborn 573

XEBIST: simplified EBIS/EBIT without magnetic field
H. Thomae, R. Becker, H. Bongers and M. Kleinod 577

Fabry–Perot spectroscopy of a visible magnetic dipole transition in Ba^{34+}
H. Adler, E.S. Meyer, F.G. Serpa, E. Takacs, J.D. Gillaspy, C.M. Brown and U. Feldman 581

X-ray spectroscopy on ECR plasmas
R. Friedlein, S. Herpich, U. Lehnert, H. Tyrroff, H. Wirth, C. Zippe and G. Zschornack 585

Measurements of X-rays from Ne recoil ions with a position sensitive detector
F. Folkmann and H.R. Nagel 589

He^{2+} on He: State-selective, scattering-angle-dependent capture cross sections measured by cold target recoil ion momentum spectroscopy (COLTRIMS)
V. Mergel, R. Dörner, J. Ullrich, O. Jagutzki, S. Lencinas, S. Nüttgens, L. Spielberger, M. Unverzagt, C.L. Cocke, R.E. Olson, M. Schulz, U. Buck and H. Schmidt-Böcking 593

A 2π steradian low energy electron spectrometer for probing multiply charged ion surface interaction
V.A. Morosov, A. Kalinin, Z. Szilagyi, M. Barat, C. Benoit, M.N. Gaboriaud and P. Roncin 597

Author index 601